STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

Standard Energy Code Proposal Form

Log No. 21-GP2-032

Code being amended: ☐ Commercial Provisions X Residential Provisions

Code Section # R403.3.2.1 Sealed air handler

Brief Description:

Add location requirement for air handlers.

Purpose of code change:

Your amendment must meet one of the following criteria. Select at least one:

☐ Addresses a critical life/safety need.

X The amendment clarifies the intent or application of the code.

☐ Addresses a specific state policy or statute. (Note that energy conservation is a state policy)

☐ Consistency with state or federal regulations.

X Addresses a unique character of the state.

☐ Corrects errors and omissions.

Check the building types that would be impacted by your code change:

X Single family/duplex/townhome

X Multi-family 1 – 3 stories

☐ Multi-family 4 + stories

☐ Commercial / Retail

☐ Institutional

☐ Industrial

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Your organization WSU Energy Program

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Economic Impact Data Sheet

Is there an economic impact: ☐ Yes X No (Positive payback or nominal $500 or less initial cost)

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants, and businesses. If you answered "No" above, explain your reasoning.

Locating air handlers in the conditioned space will reduce labor and materials costs by "right sizing" the ducts. Reduced linear footage of ductwork and smaller-diameter duct sizes are required if the HVAC contractor uses Air Conditioner Contractors of America (ACCA) manual D to size the thermal distribution system when they calculate ACCA manual J and S design loads for heating and cooling system sizing per WSEC-R. There is a one-time design change if the builder is currently locating the air handler in an unconditioned space such as a garage

or vented attic. There are also design communication needs between the designer/builder and HVAC contractor. Verifying QA, and WSEC-R and IRC/IMC-WA, compliance is simpler because the AHJ and other third-party inspectors may have better access to the air handlers located in the conditioned space for inspection and installation. There is additional thermal comfort because the air handler does not have to reheat or re-cool between HVAC cycles, thereby reducing cold cycle blow and potential behavioral energy saving when occupants do not change the thermostat settings.

Provide your best estimate of the **construction cost** (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

$Click here to enter text./square foot (For residential projects, also provide $Click here to enter text./ dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages. Provide your best estimate of the **annual energy savings** (or additional energy use) for your code change proposal?

Click here to enter text.KWH/ square foot (or) Click here to enter text.KBTU/ square foot

(For residential projects, also provide Click here to enter text.KWH/KBTU / dwelling unit)

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

Energy savings from locating the air handler in the conditioned space is currently worth 0.5 energy credit (600 kWh/year), roughly as assumed in 2018 energy credits 4.1 and 4.2 Thermal Distribution System. Leakage from the air handler and thermal conduction losses waste more energy when not located in the conditioned space. This is because the HVAC system box has the greatest pressures and temperatures when compared to leakage of a floor, wall, or ceiling supply or return register. The estimates of the SEEM model used to determine 4.1 energy credits are, therefore, conservative.

600 kWh/year x $0.10/kWh = $30-$60 per year over the life of the 1,500 sf prototype home. At a design cost of $100, the simple payback is 2 to 4 years.

List any **code enforcement** time for additional plan review or inspections that your proposal will require, in hours per permit application:

The time required for plan review and field inspections is reduced because the air handler location is preplanned, and the location and right-sized system design are required to be shown on the approved plans. Verifying QA and WSEC-R and IRC/IMC-WA compliance is simpler because the AHJ may have better access to the air handler located in the conditioned space for the purpose of inspection and installation, as noted above.

Small Business Impact. Describe economic impacts to small businesses: **NONE**

Housing Affordability. Describe economic impacts on housing affordability:

Other. Describe other qualitative cost and benefits to owners, to occupants, to the public, to the environment, and to other stakeholders that have not yet been discussed:

The life cycle of the unit is typically increased due to ideal installation practices.